

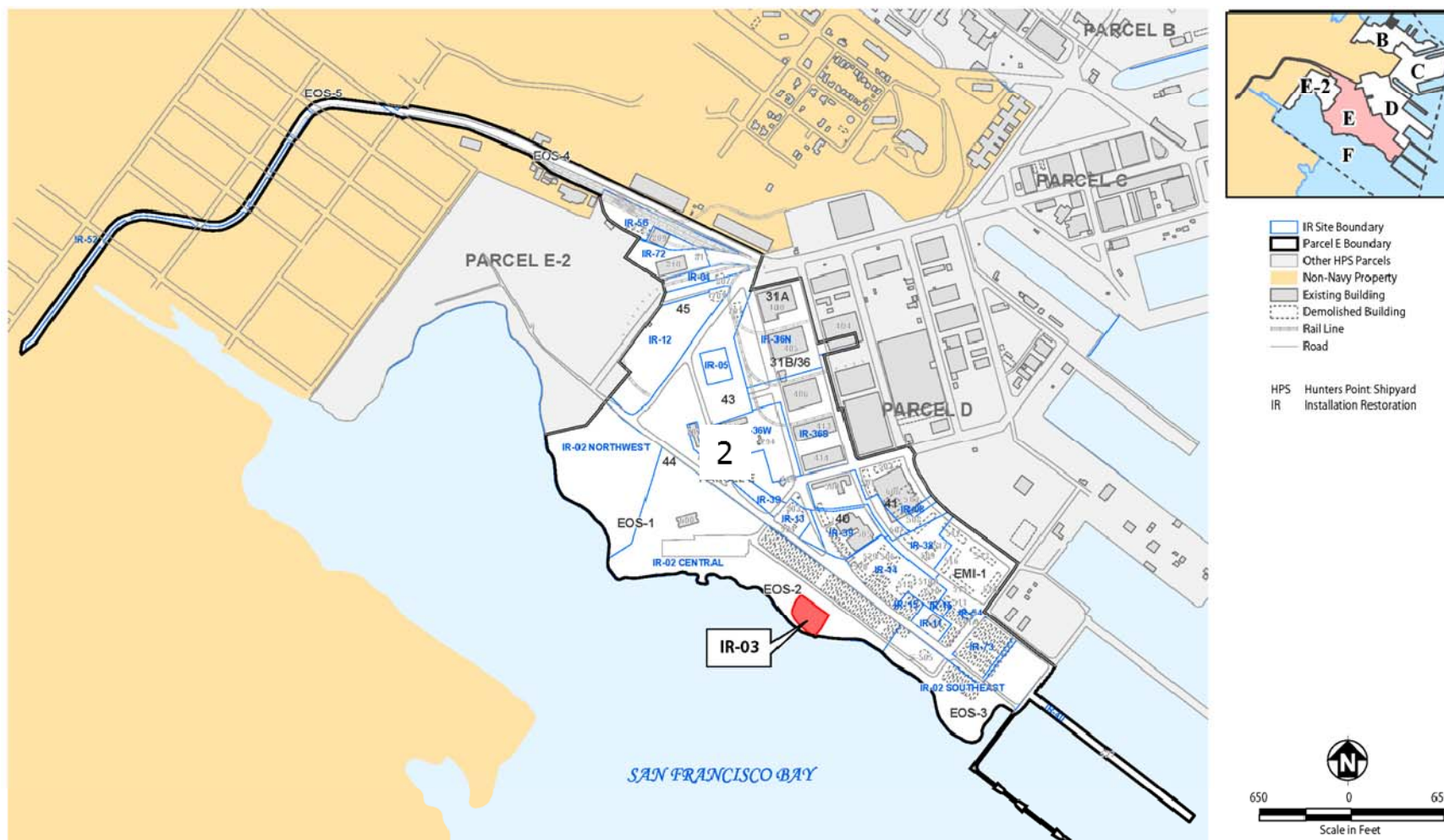


Parcel E, Installation Restoration Site 3 Pilot Study

HUNTERS POINT NAVAL SHIPYARD, SAN FRANCISCO, CA
December 5, 2012



Site Location





NAPL Treatment Pilot Study: Scope and Purpose

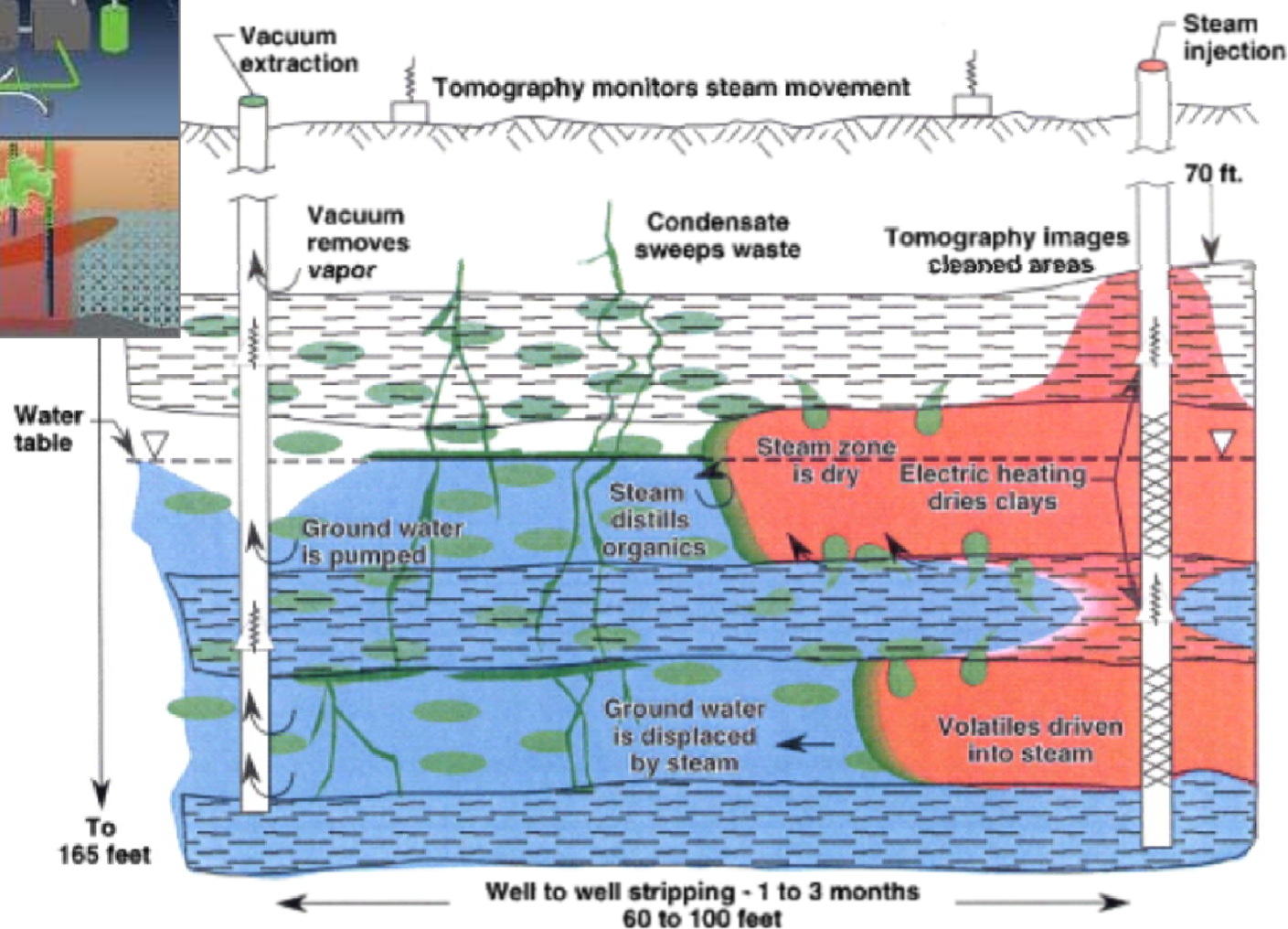
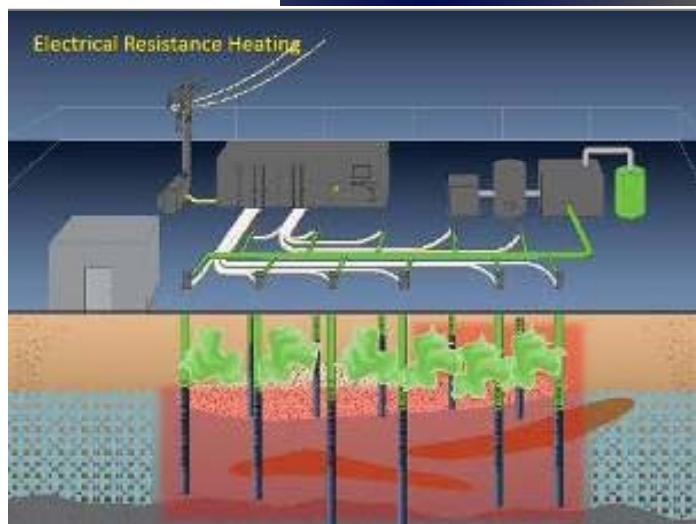


The IR-03 pilot study is intended evaluate technologies that mitigate mobile NAPL and prevent COECs and NAPL from migrating to the San Francisco Bay (Bay).

TECHNOLOGY	TYPE OF TECHNOLOGY	PERFORMANCE OBJECTIVE
ISTR	NAPL mass recovery technology	Extract and treat all <u>mobile</u> NAPL within Target Treatment Zone
ISS	NAPL mass control technology	Reduce LNAPL mobility through reducing permeability and contaminant leachability within the Target Treatment Zone.



In Situ Thermal Remediation (ISTR)



Kingston et al. State-of-the-Practice Review of In Situ Thermal Technologies, Ground Water Monitoring & Remediation

Volume 30, Issue 4, pages 64–72, Fall 2010

Lawrence Livermore National Laboratory. *Demonstration of Dynamic Underground Stripping at the: LLNL Gasoline Spill Demonstration Site*. Final Report no. UCRL-ID-116964, vol. 1-4, Lawrence Livermore National Laboratory, 1994.

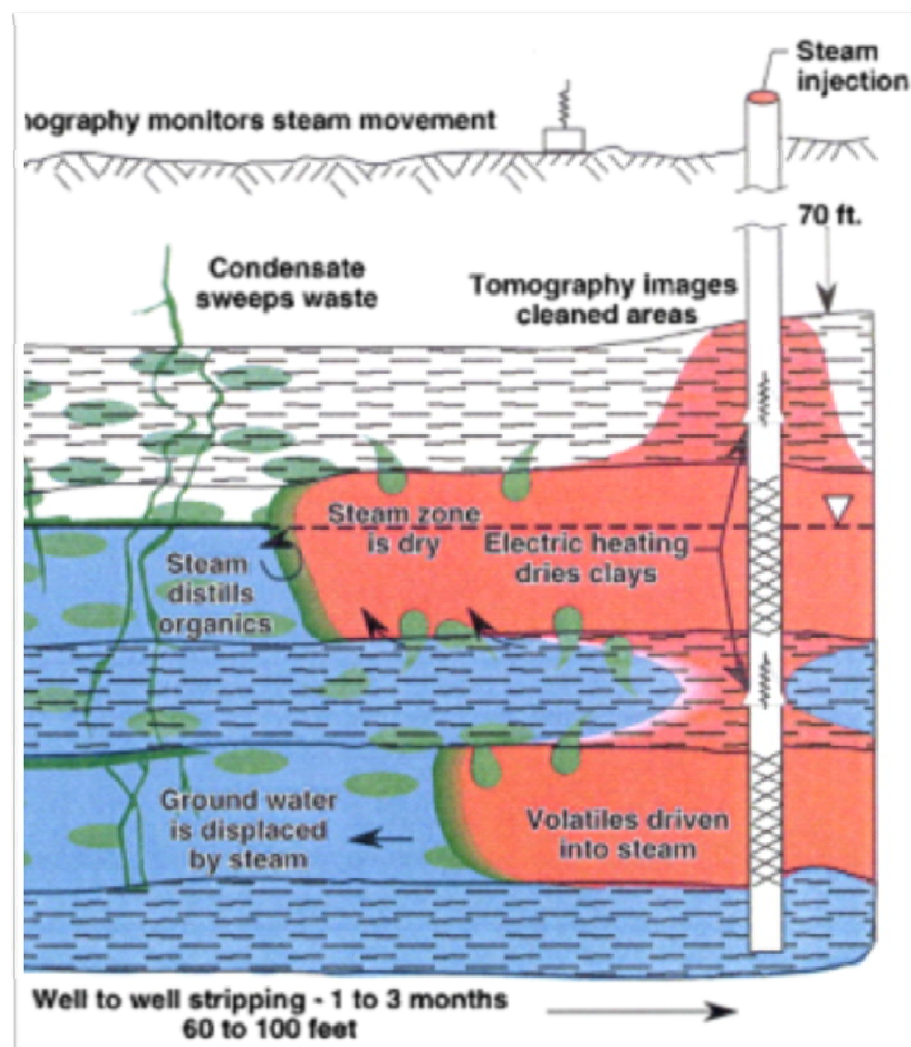


ISTR continued



The design will include:

- 62 Heating Wells
- 20 Multiphase extraction wells
- 3 Vacuum Extraction Wells
- 8 Reinjection Wells
- 9 Temperature Monitoring Points
- 15 Pressure Monitoring Points





In Situ Solidification/Stabilization (ISS)

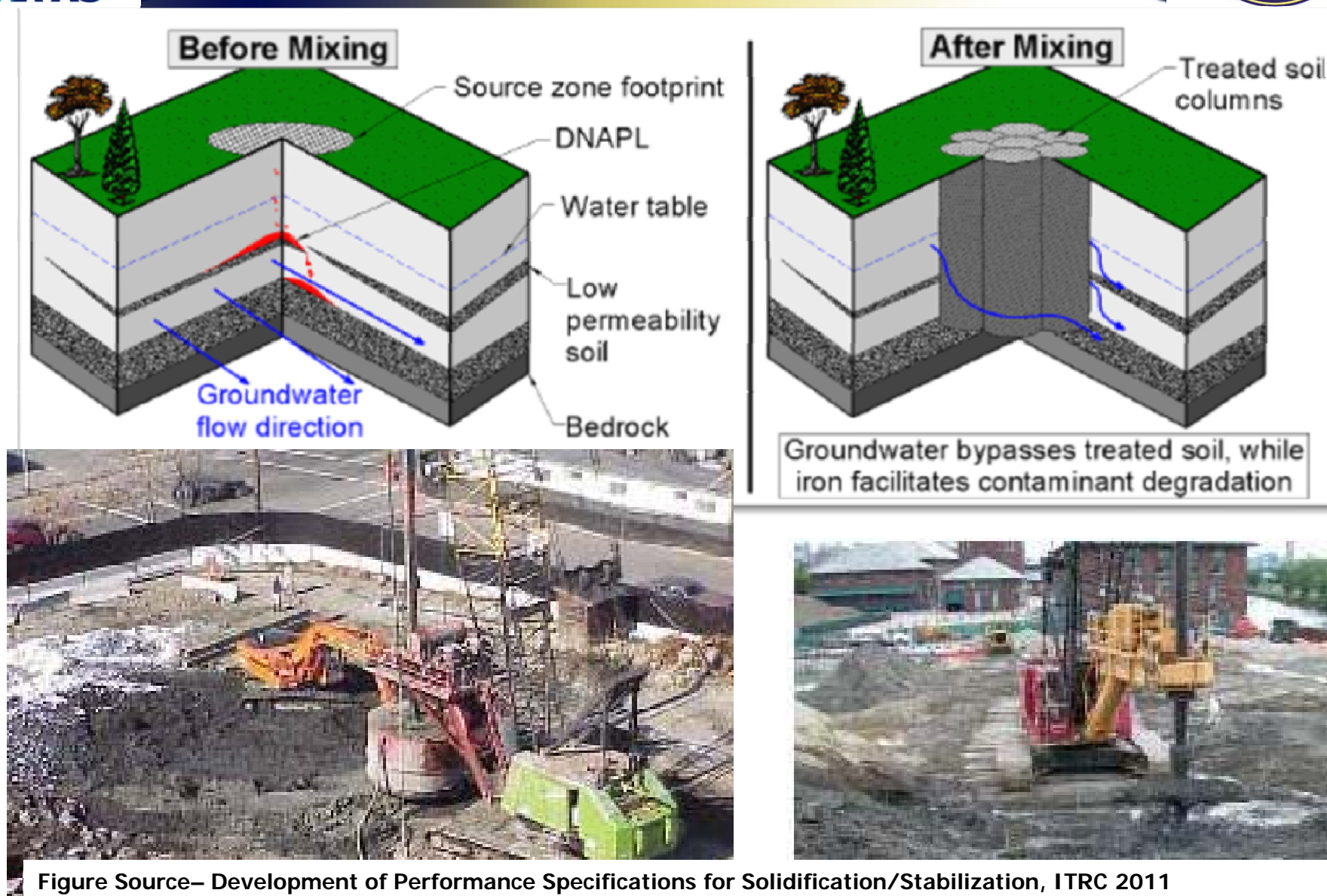
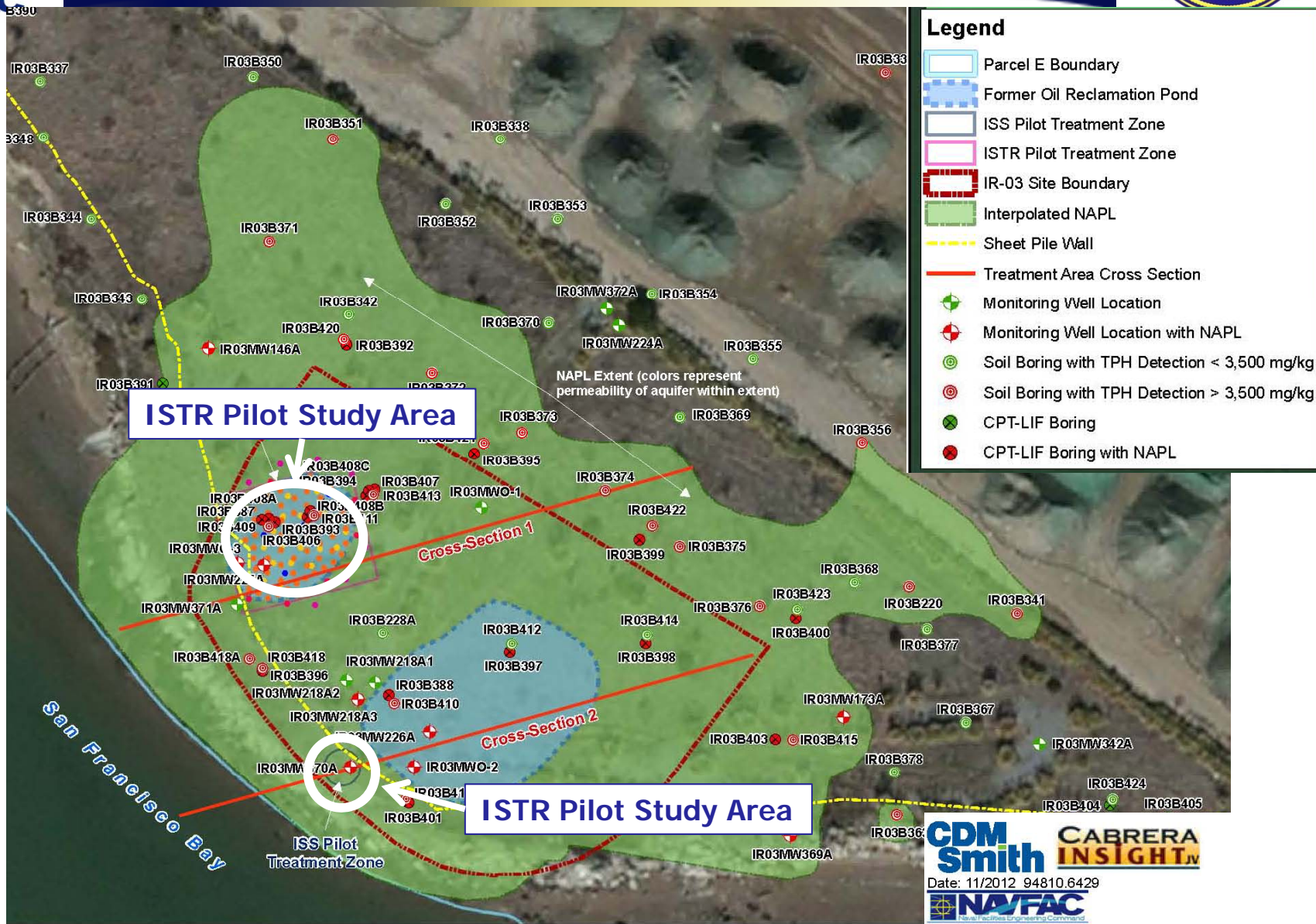


Figure Source– Development of Performance Specifications for Solidification/Stabilization, ITRC 2011



CSM: NAPL Extent

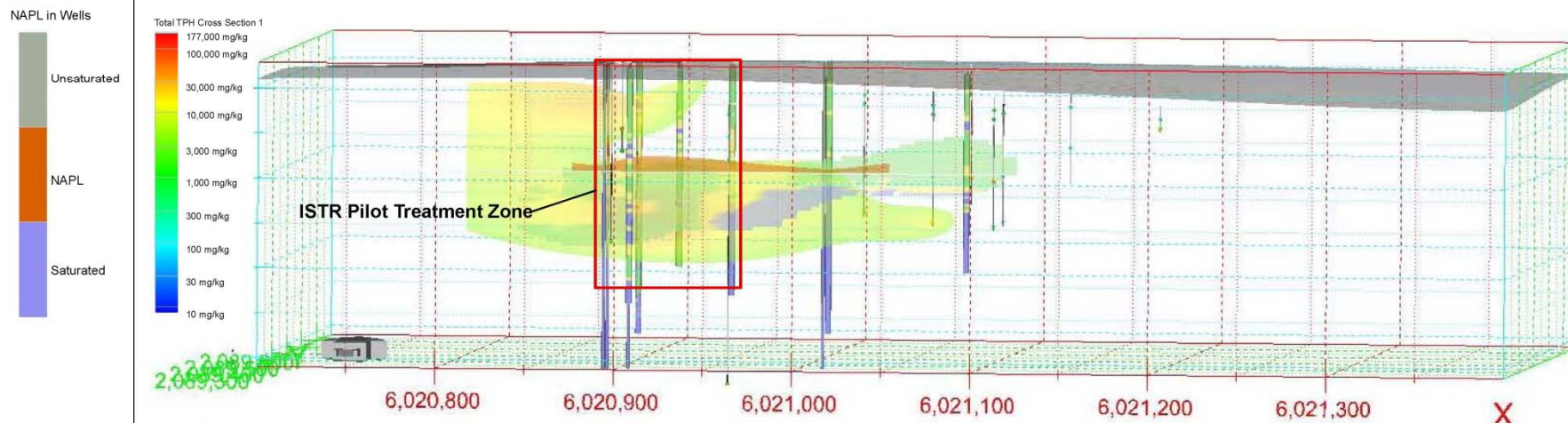




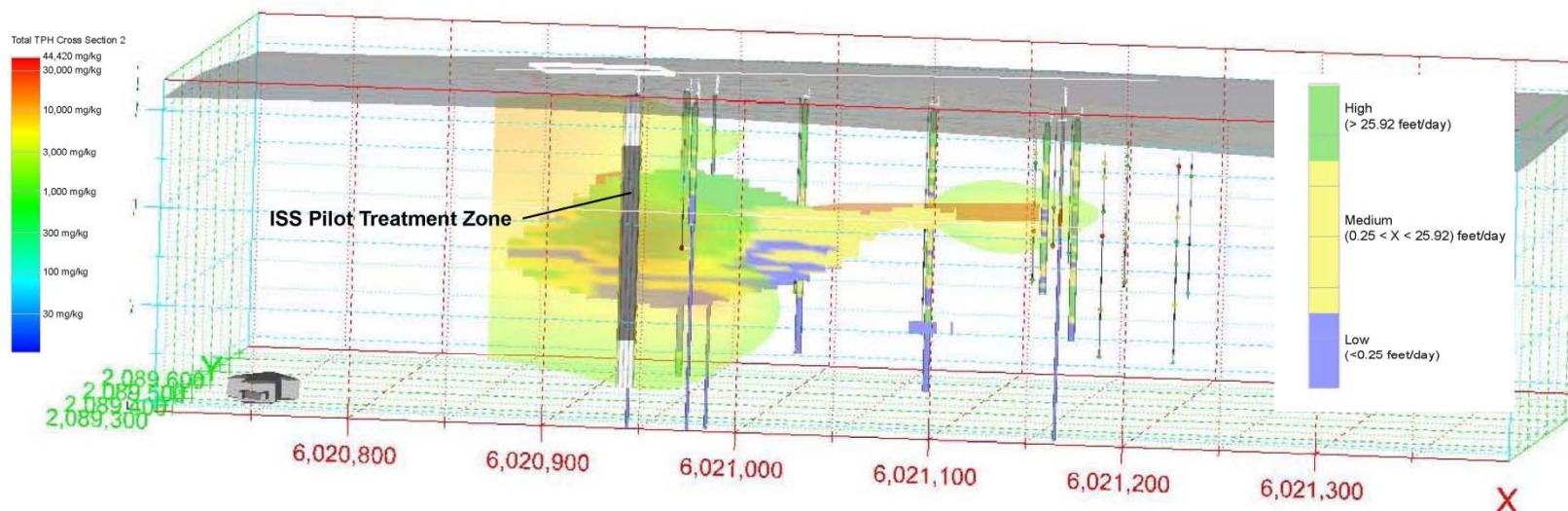
CSM: Cross Section NAPL Extent



Cross Section 1, ISTR Pilot Treatment Zone



Cross Section 2, ISS Pilot Treatment Zone





Pre-Design Characterization



- Hydraulic Gradient, NAPL Gradient and Tidal Influences
 - Determine Communication with the Bay
- Effectiveness of the Sheet Pile Wall
- Detailed NAPL Characterization
 - Determine extent of existing NAPL
- Hydraulic Conductivities and Correlation with NAPL Saturation
- Key Geochemical Parameters for ISS Design
- Bench Scale Study to Determine the Optimal ISS Mixture



Schedule



KEY DATES

- **Jan 8:** Working Meeting with the BCT
- **Jan 21:** Draft Work Plan Submitted to BCT
- **March 12:** Pre-Characterization Field Work Begins
- **June 4:** Final ISTR Design Submitted to BCT
- **July 1:** Begin ISTR Field Work
- **Sept 25:** Final ISS Design Submitted to BCT
- **Oct 10:** Begin ISS Field Work